

A REVIEW OF THE GENUS *PERITHOUS*, WITH DESCRIPTIONS OF NEW TAXA

(HYMENOPTERA: ICHNEUMONIDAE)

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Perithous Holmgren is a small genus belonging to the tribe Theroniini, subfamily Pimplinae (= Ephialtinae). It is mainly distributed in the Holarctic Region. Hosts are aculeate Hymenoptera (larvae of Sphecidae, Vespidae, and Chrysididae) in stems and twigs, particularly of *Rosa* and *Rubus*. There are reports, however, of attacks on larvae of Xiphydriidae, Cerambycidae and some Lepidoptera.

In this paper the world species are reviewed, with some new diagnostic characters. The distributional ranges of the American and European subspecies of *P. mediator* are analyzed. Three new species (*digitalis*, *kamathi* and *sundaicus*) and two new subspecies (*digitalis taiwanensis* and *divinator himalayensis*) are described from Kashmir and Himachal Pradesh in India (areas of Palaearctic affinities) and Java and Taiwan (typically Oriental), thus extending the known distribution of the genus to the Oriental Region.

Baltazar (1961) described *Hybomischos* as a subgenus of *Perithous* from the Philippines, distinguishing it mainly in having lateral spine-like teeth at the base of first tergite, its spiracle distant from lateral carina, ovipositor tip sinuate and thickened before apex, and by the absence of notauli in the female. Aubert (1969) synonymized it with *Perithous*, while Constantineanu & Pisićă (1977) treated it as a distinct genus. *Hybomischos* is here considered a separate genus. It is treated in an adjacent paper.

Genus *PERITHOUS* Holmgren (figs. 1-4)

Perithous Holmgren, 1959. Öfvers. Svenska Vetensk.-Akad. Forh., 16: 123. Type-species: *Ephialtes albicinctus* Gravenhorst; designated by Viereck, 1914.

Taxonomy: Oehlke, 1966: 279. Aubert, 1969: 100. Townes, 1969: 126. Constantineanu & Pisićă, 1977: 86.

Body moderately long and slender. General coloration black with mesoscutum and mesopleurum often reddish and abdominal tergites narrowly margined with yellow (some species with black thorax). Legs pale brown. Face of male whitish and of female black with whitish orbital borders.

Antenna moderately long and slender to shorter and a little thickened subapically. Clypeus flattened apically and with a deep median apical notch. Mandibular teeth equal in length and similar in shape. Face a little convex, sparsely to moderately punctate. Eyes only slightly emarginate just above antennal sockets (cf. *Hybomischos*). Occipital carina complete, without a median apical dip. Epomia short. Prepectal carina dorsad to 0.7 the height

of mesopleurum. Notauli weakly impressed anteriorly. Propodeum convex, with only the apical transverse carina present, which is semicircularly arched and usually complete. Fore wing with stub of ramellus distinct and continued to some distance as a brownish or unpigmented groove. Areolet triangular, receiving second recurrent vein near its outer corner. Nervellus intercepted above the middle. Tarsal claws of female without a lobe or an enlarged spatulate bristle. First abdominal tergite convex dorsally, with short median dorsal carinae enclosing a basal declivity, its dorsolateral carina present, and baso-lateral corner not projecting as a tooth. Spiracle just below the dorsolateral carina and touching or almost touching it. First sternite with a carina-like median fold, the basal end of which may or may not be projecting out. Second to fifth abdominal tergites with low smooth tubercles. Those on second often fused into a rhomboidal area. Ovipositor 0.8 to 1.5 x as long as the body, compressed, weakly upcurved, its tip with lower valve occupying almost the entire depth, teeth compressed and close together or spaced out to an area about 5.0 x the depth of ovipositor (figs. 1-3). Upper valve with slanting ridges, but not appearing saw-like in profile view (cf. *Hybomischos*).

Some recent studies on *Perithous* are: Townes & Townes (1960), on North American species; Townes, Momoi & Townes (1965), A Catalogue of Eastern Palaearctic species; Oehlke (1966), on Taxonomy of Haupt species; Oehlke (1967), Catalogue of Western Palaearctic species; and Constantineanu & Constantineanu (1968) and Constantineanu & Pisciã (1977), on Rumanian species. Aubert (1969) also catalogued the West Palaearctic species, with notes on hosts. These papers should be consulted for fuller bibliographic references and synonymy of the species. Biological references mainly mention host records and are given in the above references as well as in Carlson (1979). Short (1978) figures the larval head of *Perithous divinator divinator*. The larva has a large tooth-like projection at the junction of the base and blade of the mandible and has three sensilla on maxillary and labial palpi (fig. 4). In other genera of Theroniini, there are only 2 sensilla on these palpi.

Species that have been described under *Perithous* or those that belong to that genus (in the strict sense) are listed below, with their present status. Taxa that have been described as subspecies and are no longer considered valid and other synonyms not originally described under *Perithous* are omitted. These can be found in the various catalogues mentioned above. Species falling under *Hybomischos* are also not included as they are being treated in a separate paper that follows.

The following species have so far been reported under *Perithous* :

1. *albicinctus* (Gravenhorst), 1829. Europe, USSR, Japan.
Originally described under *Ephialtes* but transferred to *Perithous* by Holmgren. Valid species.
2. *brunnescens* Koornneef, 1951. Europe.
Synonymized by Oehlke (1967) under *Perithous (Hybomischos) septemcinctorius* (Thunberg).
3. *divinator* (Rossi), 1790. Europe, USSR, North Africa, North China, North America.
Originally described under *Ichneumon* and first transferred to *Perithous* by Marshall, 1872. Valid species. *P. pimplarius* Haupt is a synonym of it (cf. Oehlke, 1966).

4. *exiguus* Haupt, 1954. Europe.
Synonymized by Oehlke (1966) under *P. (Hybomischos) septemcinctorius*.
5. *japonicus* Uchida, 1928. Japan.
Reduced to a subspecies of *P. mediator* (Fabricius) by Townes & Townes (1960). Valid subspecies.
6. *longiseta* Haupt, 1954. Europe.
Synonymized with *P. mediator* by Oehlke (1966). Constantineanu & Constantineanu (1968) considered it a valid species, represented by two subspecies *longiseta longiseta* Haupt and *longiseta moldavica* Const. & Const. from Rumania. Not seen.
7. *mediator* (Fabricius), 1804. Holarctic.
Originally described under *Pimpla* and transferred to *Perithous* by Holmgren, 1860. Townes & Townes (1960) recognized four subspecies under it from Europe, North America, and Japan. Townes, Momoi & Townes (1965) included *nigrinotum* Uchida from China as another subspecies. Valid subspecies.
8. *neomexicanus* (Viereck), 1903. North America.
Originally described under *Pimpla* and first placed as a synonym of *P. pleuralis* Cresson by Townes (1944) and subsequently (1960) treated as a subspecies of *P. mediator* (Fabricius). Valid subspecies.
9. *nigrinotum* Uchida, 1942. China.
Townes, Momoi & Townes (1965) reduced it to a subspecies of *P. mediator*. Valid subspecies.
10. *nigrigaster* Constantineanu & Constantineanu, 1968. Europe: Rumania.
11. *pleuralis* Cresson. North America.
Townes (1960) considered it as a subspecies of *P. mediator*. Valid subspecies.
12. *pimplarius* Haupt, 1938. Europe.
Oehlke (1966) synonymized it with *P. divinator* (Rossius). Constantineanu & Constantineanu (1968), however, considered it distinct. Not examined.
13. *speculator* Haupt, 1954. Europe.
Oehlke (1966), who examined the type considered it distinct. Constantineanu & Constantineanu (1968) reported it from Rumania, with two subspecies: *speculator speculator* and *speculator transylvanicus*. Not seen.

In addition the following species and subspecies are described here as new from the Orient.

1. *divinator himalayensis*, n. subsp. Himachal Pradesh and Uttar Pradesh, India.
2. *digitalis*, n. sp., with three subspecies:
 - (a) *digitalis digitalis*, n. subsp. Kashmir, India
 - (b) *digitalis nepalensis*, n. subsp. Nepal.
 - (c) *digitalis taiwanensis*, n. subsp. Taiwan.
3. *sundaicus*, n. sp. Java, Indonesia.
4. *kamathi*, n. sp. Himachal Pradesh, India.

PART I. THE HOLARCTIC SPECIES

Since all the European species so far described were not available for study, a key to the world species is not attempted. Notes on all species known to me are given below, incorporating new diagnostic features observed on the metasternum, posterior mesosternal carina and the nature of the submetapleural carina. These characters helped in the recognition of the new taxa described in Part II of this paper.

1. PERITHOUS ALBICINCTUS (Gravenhorst)

Ephialtes albicinctus Gravenhorst, 1829. Ichneumonologia europaea, 3: 259. ♀. des. Type ♀, Germany: Hannover (Wroclaw).

Perithous albicinctus: Holmgren, 1860. Öfvers Svenska Vetensk.-Akad. Forh., 16: 123. Uchida, 1928. J. Faculty Agr. Hokkaido Imp. Univ., 25: 91.

Taxonomy: Townes et al., 1965: 69. Oehlke, 1967: 35.

Biology: Mirek, 1963: 419. Aubert, 1969: 100.

The posterior metasternal carina is curved and only slightly raised in the middle, appearing like two low tubercles between the hind coxae. Median metasternal furrow is deep and wide. Submetapleural carina is almost complete to (but not quite touching) metasternal carina and flattened and wider just above middle coxa (projection above middle coxa broadly rounded and its anterior margin reflexed). Antennal flagellum composed of 37 segments, slender. Ovipositor longer than body and its tip with teeth which are widely spaced and occupying an area about 4.0 x its depth. First abdominal sternite with only a moderately projecting basal tooth.

This species is distinctive in having a black thorax without reddish parts, which is also the case in *mediator japonicus* from Japan, and *sundaicus*, n. sp. described from Java.

Hosts: *Ectemnius nigritarsus* (H.-S.) (Hymenoptera: Sphecidae). Mirek (1963) has published on the biology of this species.

Distribution: Europe (England, Germany, Poland, Belgium, Finland, Sweden, France, Austria, Czechoslovakia, Switzerland, Rumania, U. S. S. R.), Japan. Specimens from Germany seen in Townes Collection.

2. PERITHOUS MEDIATOR (Fabricius)

The posterior metasternal carina is better developed and more prominent in this species than in the preceding species. Tubercle-like prominences in the middle are low but distinct. Median metasternal furrow narrow and sometimes partly obliterated. Submetapleural carina complete to metasternal carina and forming a short conical projection above middle coxa (in American subspecies this projection without a reflexed margin and somewhat broader and thin; in Chinese subspecies also a little broader but reflexed). Ovipositor longer than body and its tip with widely spaced teeth occupying an area about 5.0 the apical depth of ovipositor. First sternite with a distinct conical or obtuse projection at base, better developed than in *albicinctus*. Antennal flagellum longer and slender (cf. *divinator*).

This species is widespread in Eurasia and North America. Five subspecies are recognized (*mediator*, *japonicus*, *nigrinotum*, *pleuralis* and *neomexicanus*). The non-reflexed nature of the submetapleural projection in the North American subspecies readily separate them from the Eurasian

subspecies. The coloration of the various subspecies is diagnostic, although the subspecies do show variations and perhaps intergrade in zones of overlap. Some of the new subspecies described by Constantineanu & Constantineanu have been synonymized with this subspecies by Aubert (1969) but this aspect could not be verified as specimens of those subspecies were not available.

Key to the subspecies of *Perithous mediator*

1. Thorax wholly black except for yellow lines along upper margin of pronotum, submetapleural ridge, mesepimeron, and apices of scutellum and meta-scutellum. Hind tibia and tarsus blackish-brown and femur reddish-brown, without any distinct black marks. Antenna black. Flagellar segments 33 ± 2 . Japan, Korea, Sakhalin.
mediator japonicus Uchida (p. 7)
- Thorax with mesopleurum and often also the mesoscutum reddish-brown. Mesepimeron brown or black. Hind tibia and tarsus black marked. Hind femur with or without black marks. 2
2. Mesopleurum with an oval yellow spot at dorsal end of prepectal carina. Mesoscutum black. Scutellum largely yellow. Hind tibia and tarsus pale yellow with blackish marks. Hind femur without black mark. Face broadly yellow on sides. Antenna brown. Flagellar segments 28 (only 1♀ known). China: Manchuria.
mediator nigrinotum Uchida (p. 6)
- Mesopleurum without a yellow spot. Mesoscutum usually wholly reddish-brown, but sometimes brownish to blackish with reddish lines. Specimens from North America with black mesoscutum also have apex of hind femur black. 3
3. Submetapleural projection above middle coxa conical and with a reflexed margin. First abdominal tergite largely smooth with scattered minute punctures. Second and following tergites also largely smooth in apical half. All legs of female reddish-brown with only inconspicuous fuscous marks on hind tibia and tarsus. Male fore and middle coxae may be yellow. Antenna brown. Flagellar segments 31 ± 3 (less in specimens from Italy, which are comparatively smaller). Europe.
mediator mediator (Fabricius) (p. 6)
- Submetapleural projection above middle coxa broader and without a reflexed margin. First abdominal tergite with denser punctation; other tergites also with crowded punctures, particularly in basal half. Hind tibia and tarsus of female yellowish to brownish with conspicuous dark fuscous marks. Fore and middle coxae partly whitish. Antenna black in female, brownish black in male. 4
4. Hind femur without a black apical mark (rarely faintly infuscate). First abdominal tergite with punctures well-separated. Punctures on second tergite crowded in its basolateral areas, but centrally (including swellings) smooth and with widely scattered and minute punctures. Mesoscutum usually reddish brown. Hind tibia and tarsus pale with black marks. North America in Rocky mountains and west of them.
mediator neomexicanus (Viereck) (p. 8)

Hind femur always with an apical black ring. First and second abdominal tergites with crowded punctures, those on second extending over the basal half of swelling (except rarely particularly specimens from N. W. parts of range). Mesoscutal color varying from reddish-brown to black. Hind tibia and tarsus often dark. North America east of Rocky mountains and Alaska and also in mountains of British Columbia and Oregon (zones of overlap). . . . mediator pleuralis (Cresson) (p.8)

2a. PERITHOUS MEDIATOR MEDIATOR (Fabricius)

Pimpla mediator Fabricius, 1804. Syst. Piez., 2: 117. ♀. des.

Type ♀, Czechoslovakia: Mähren (Kiel, on deposit in Copenhagen).

Perithous mediator mediator: Townes & Townes, 1960. U. S. Natl.

Mus. Bull., 216(2): 214. ♂, ♀. England, Germany.

Taxonomy: Oehlke, 1967: 35 (full synonymy).

Biology: Borries, 1897: 153-159. Brocher, 1926: 393-410. Aubert, 1969: 102.

Characterized by having punctures on abdominal tergites rather fine and sparse. Submetapleural carina with a short conical projection above middle coxa with its apical margin reflexed. Antenna brownish. Mesopleurum, mesoscutum, scutellum (except apically), and often the upper dorsal margin of pronotum reddish-brown (extreme apical margin of pronotum yellow); tegula brown. Subtegular ridge yellow. Head black with inner orbital borders yellow. All legs orange-brown with hind tibia and tarsus with rather inconspicuous light fuscous marks. Propodeum with a crescentic yellow mark in the middle along apical transverse carina. Abdominal tergites narrowly yellow along their apical margins.

Specimens from Italy are more yellow: face is largely yellow with black mark confined in the middle (one female normal); clypeus is also largely yellow; fore coxa is lighter in color and is yellowish; and the apical margins of abdominal tergites are more distinctly yellow. Specimens from U. S. S. R. almost lack the yellow mark on propodeum and the yellow apical bands on abdominal tergites are rather narrow.

The males have the face wholly yellow, fore and middle coxae yellow, their tibiae and tarsi also yellow but marked with orange, particularly femora, and hind coxa and femur orange, their tibia and tarsus yellow with light fuscous markings. In one male from Italy there is a yellow faint spot on mesopleurum as seen in female of *nigrinotum*.

Hosts: Aubert (1969) gives a long list of hosts. They belong to Coleoptera (Cerambycidae) and Hymenoptera (Xiphydriidae, Cynipidae, Chrysididae, Eumenidae, Sphecidae, and Megachilidae).

Distribution: Widely distributed in Europe, England, USSR. Specimens from USSR, Germany, Czechoslovakia, Italy, Denmark, Sweden, and England seen in Townes and Ottawa Collections.

2b. PERITHOUS MEDIATOR NIGRINOTUM Uchida

Perithous mediator (!) nigrinotum Uchida, 1942. Ins. Matsumurana, 16: 118. ♀. des. Type ♀, China: Kaiyuan in Manchuria (Sapporo). Examined, 1980.

Perithous (Perithous) mediator nigrinotum: Townes et al., 1965. Mem. Amer. Ent. Inst., 5: 69.

This subspecies is known only from the female type-specimen from Kaiyuan (= Kaigen), Manchuria. It is rather similar to the typical subspecies but the propodeum is shiny, impunctate, and the second and third abdominal tergites are more definitely punctate, the punctures separated from each other by about 1.5 to 2.0 their diameter. Facial punctures somewhat larger but sparser than in *mediator mediator*. Submetapleural projection above middle coxa not very acute, its margin narrowly reflexed. Face more yellowish on sides, median black mark narrow towards antennal sockets (which are yellow). Antenna brownish, yellowish ventrally towards base. Pronotum black with a yellow line along its upper margin. Mesoscutum and metapleurum black. Mesoscutum with faint brownish-yellow lines. Mesopleurum largely orange-brown with a yellow spot near upper end of prepectal carina. Scutellum, metascutellum, tegula, and subtegular ridge yellow. Propodeum black with a broad crescentic yellow mark along apical transverse carina. Apices of all abdominal tergites yellow. Fore and middle legs largely yellow with their femorae yellowish orange. Hind leg orange-brown up to femur, its tibia and tarsus yellowish and with fuscous marks subbasally and apically on tibia and at apices of tarsal segments.

Distribution: China: Manchuria.

2c. PERITHOUS MEDIATOR JAPONICUS Uchida

Perithous japonicus Uchida, 1928. J. Fac. Agri. Hokkaido Imp. Univ., 25: 91. ♀, ♂. des., fig. Lectotype ♀, Japan: Yamagata (Sapporo). Japan: Sapporo, Nikko; Sakhalin.

Perithous mediator japonicus: Townes & Townes, 1960. U. S. Natl. Mus. Bull., 216(2): 214. key, des. Japan.

Taxonomy: Townes et al., 1965: 69.

Similar to the typical subspecies in having an acute submetapleural projection above middle coxa with its margin reflexed. Propodeum punctate as in *mediator mediator*. Facial punctures comparatively coarser and abdominal tergites, particularly the first and second more densely punctate (first tergite smoother with scattered punctures in *mediator mediator* and *m. nigrinotum*).

Facial orbits broadly yellow. Black mark on face parallel-sided (variable in width). Thorax black except for yellow marks along upper margin of pronotum, tegula (brownish-yellow), subtegular ridge, apical half of scutellum, metascutellum, and a crescentic to circular mark on propodeum along apical transverse carina. Apical margins of abdominal tergites yellow. Fore and middle coxae yellow. Hind coxa reddish-brown. Fore and middle femora yellowish-brown and their tibiae and tarsi infusate. Hind femur reddish-brown. Hind tibia and tarsus blackish-brown.

Distribution: Japan, Korea and Sakhalin. Specimens from Hokkaido, Kamikochi and Tanigumi Prov., Japan, examined in Townes Collection.

Hosts: Unknown.

Alaskan specimens of *mediator pleuralis* somewhat approach this subspecies in body punctation and color of hind leg. *Japonicus* also resembles *albicinctus* in coloration, but submetapleural carina is complete and the basal conical projection on first sternite is distinct. The submetapleural projection above middle coxa is short, conical and with a reflexed margin.

2d. PERITHOUS MEDIATOR NEOMEXICANUS (Viereck)

- Pimpla neomexicana* Viereck, 1903. In Skinner: Trans. Amer. Ent. Soc., 29: 88. ♀. des. Type ♀, Beulah, N. Mexico (Philadelphia).
Perithous mediator neomexicanus: Townes & Townes, 1960. U. S. Natl. Mus. Bull., 216(2): 213.
Perithous (Perithous) mediator neomexicanus: Carlson, 1979. In Krombein et al.: Catalog of Hymenoptera in America North of Mexico, 1: 348.
 Biology: Parker and Bohart, 1966: 94.

This and the other American subspecies differ from the typical subspecies in having a thin and broader submetapleural projection above middle coxa, the apical margin of which is not reflexed. The punctation on abdominal tergites is also denser. The fore and middle coxae are often partly yellowish-white and hind tibia and tarsus with distinct black markings. The males are not very distinctive, except that in males of *neomexicanus*, the antenna tend to be dark brown to black and black markings on hind leg are more conspicuous.

First abdominal tergite with scattered punctures. Second tergite with punctures confined mostly in basolateral areas. Swellings on it largely smooth (cf. *pleuralis* and *japonicus*). Hind leg brown with tibia and tarsus broadly infuscate (usually only the apices of tarsal segments black and tibia largely yellowish-brown along inner side). Hind femur without black apical mark (except rarely faintly so). Mesoscutum usually entirely reddish-brown. Yellow markings on face, propodeum, and abdominal tergites as in the typical sub-species.

Host: *Pemphredon confertim*.

Distribution: North America in Rocky mountains and west of the same. Specimens from various localities in Alberta, Arizona, Idaho, Colorado, California, Montana, Oregon, British Columbia, New Mexico and Washington State seen in Townes and Ottawa Collections.

2e. PERITHOUS MEDIATOR PLEURALIS (Cresson)

- Perithous pleuralis* Cresson, 1868. Canad. Ent., 1: 46. ♀. des. Type ♀, Ontario: Grimsby (lost).
Perithous mediator pleuralis: Townes & Townes, 1960. U. S. Natl. Mus. Bull., 216(2): 211.
Perithous (Perithous) mediator pleuralis: Carlson, 1979. In Krombein et al.: Catalog of Hymenoptera in America North of Mexico, 1: 348.
 Biology: Champlain, 1922: 97. Rheinhard, 1929: 155. Krombein, 1960: 31.

Readily distinguished from *neomexicanus* as well as from *mediator mediator* by having crowded punctures on first and second abdominal tergites, those on second tergite extending a little over the swellings, at least in basal half (except rarely), hind leg brown with femur always having an apical black ring which is usually wide, about as wide as the apical depth of femur, hind tibia and tarsus yellowish with black apical marks, but often tibia and tarsus with extensive black marks, color of mesoscutum varying from reddish-brown to black, mesopleurum also often black dorsally, abdominal tergites sometimes only with faint yellow margins, and fore and middle legs also sometimes tending to be infuscate.

Specimens from Alaska and British Columbia are generally darker, with mesoscutum black, with or without two small reddish lines, hind femur with wider black apical band, hind tibia and tarsus almost wholly black in female and with white markings in male.

This subspecies intergrades with *neomexicanus* in the northern parts of its distributional range and specimens of both the subspecies have been collected in Oregon (same locality) as well as in British Columbia and Idaho.

Hosts: *Pemphredon concolor*, *P. inornatus*, and *P. harbecki*?

Distribution: North America east of Rocky mountains and Alaska. Also occurring in British Columbia mountains, Idaho, and Oregon. Specimens from most eastern states north to Michigan as well as Quebec seen in Townes Collections.

3. PERITHOUS DIVINATOR (Rossi)

Ichneumon divinator Rossi, 1790. Fauna Etrusca, 2: 48. ♀. des.

Type ♀, Italy: Etrusca (location?).

Perithous divinator: Marshall, 1872. Catalog of British Hymenoptera, p. 86. England.

Taxonomy: Townes & Townes, 1960: 215. Townes et al., 1965: 69.

Oehlke, 1967: 35. Carlson, 1979: 348.

Biology: Horstmann, 1964: 193. Thomas, 1964: 199. Horstmann, 1967: 95. Aubert, 1969: 101.

In this species the median portion of posterior mesosternal carina forms a posteriorly directed pair of closely set tubercles, which are also hairy, metasternal furrow shallow to obliterated, submetapleural carina narrow, complete to metasternal carina or slightly short of it, not widened above middle, midventral fold of first sternite not forming a conical projection at base, antenna short and a little thickened subapically, about 0.75 the length of body, flagellum composed of 28 ± 2 segments, ovipositor short, about 0.8 the body length, its tip with teeth occupying an area which is only about 2.5 its apical depth, teeth comparatively closely set, scape and pedicel combined a little longer than second flagellar segment (14: 12), and nervellus intercepted at its upper 0.33.

Head black with inner orbits, base of clypeus, mandible, and scape and pedicel beneath, yellow. Upper margin of pronotum, subtegular ridge, apex of scutellum, metascutellum and an arched mark on propodeum, yellow. Mesoscutum, mesopleurum, mesosternum, and legs reddish-brown. Thorax otherwise black. Hind tibia and tarsus often lightly infuscate. Abdominal tergites black with apices of second and the following tergites narrowly to faintly yellow. Sometimes these yellow lines partly obliterated.

In males, face wholly yellow and tegula and fore and middle legs largely yellowish-white with hind tibia and tarsus blackish dorsally.

This species apparently has a wide range of distribution, having been recorded from Europe, USSR, North Africa, North America and Northern China. I have examined specimens of it from England, Sweden, Germany and Eastern North America in Townes Collections and Canadian National Collections. According to Townes & Townes (1960) it is an introduced species in North America.

A new subspecies, *divinator himalayensis*, is described here from Himachal Pradesh, India. The European and American populations should therefore be referred to as *divinator divinator*.

Regional color variations occur in the various populations of *divinator divinator* studied. The females from Sweden have two small yellow spots on

the face just below antennal sockets, connected to the yellow orbital stripes (as is also seen in American specimens). In males the hind coxa is lightly infusate on the inner side. In all European specimens the tegula is yellowish-brown, and hind tibia and tarsus faintly infusate.

Specimens from England tend to be darker, with mesopleurum and mesoscutum darker reddish-brown, fore coxa partly yellow, hind coxa largely infusate, hind tibia and tarsus brownish-black, tegula dark brown in female and brownish-yellow in male, and mesopleurum often black along prepectus and along mesopleural groove (varying in extent in different specimens). The yellow marks on abdomen and propodeum are extremely narrow and often absent.

The North American specimens have bright reddish-brown mesopleurum, mesoscutum, and all coxae of female (as in European specimens), except fore coxae often partly yellow, the hind tibia and tarsus of female lightly infusate, tegula yellow, male fore coxa yellow, and yellow lines on abdomen and propodeum more prominent. Even the orbital yellow stripes are a little wider and often there are two small yellow spots below antennal sockets which may be or may not be connected with the orbital stripes.

One female from Bulgaria: Sozopol, in Townes Collection, is rather different and fits the description of *Perithous pimplarius* Haupt. The first abdominal segment is short with a deep declivity at base and second and third abdominal tergites are transverse (wider than long) rather than long as is usual in the genus. The flagellum is short (27-segmented), scape and pedicel combined not longer than second flagellar segment, abdominal tergites including postpetiole more densely punctate, tubercles on abdominal tergites more prominent and oblong, nervellus intercepted almost at middle, tegula yellowish-white, scutellum largely yellow and apex of first tergite white (never seen in the specimens of *divinator* with me), and yellow lines on abdominal tergites more distinct.

Whether or not this specimen represents one of the species described by Haupt or Constantineanu could not be decided without reference to the type-specimens. Horstmann (1967) has incidentally shown that the nature of the abdomen in *divinator* can vary with reference to its hosts, and therefore he synonymized *P. pimplarius* with *divinator*.

Hosts: Chiefly parasitic on species of *Pemphredon*, *Passoloceus*, *Psenulus*, *Trypoxylon*, and other Sphecidae in Europe and North America. Aubert (1969) lists several hosts belonging to Coleoptera (Cerambycidae), Lepidoptera (Pyralidae), and Hymenoptera (Cynipidae, Chrysididae, Eumenidae, and Sphecidae).

Distribution: Europe (Italy, Germany, France, England, Finland, Rumania, Czechoslovakia, Spain, USSR), North Africa, China, Canada, U.S.A. In North America distributed mainly from Quebec south to Connecticut and Pennsylvania and west to Wisconsin.

II. DESCRIPTIONS OF NEW TAXA FROM THE ORIENT

Key to the Oriental Species of *Perithous*

1. Mesopleurum and mesoscutum black with yellow spots or stripes, finely polished. Metapleurum and metasternum also polished. Submetapleural carina flattened out and forming a triangular or rounded projection over base of middle coxa (fig. 1). 2
- Mesopleurum and mesoscutum reddish-brown, subpolished. Metapleurum with minute punctures or smoother (*digitalis*). Metasternum smooth or hairy. Submetapleural carina narrow and not flattened or widened above middle coxa (fig. 2, 3) more reflexed. 3
2. Metasternal carina forming conical projections in the middle between hind coxae (fig. 1). Median metasternal groove absent and represented by a small pit only. Submetapleural carina distinct on anterior 0.8 of metapleurum and forming a triangular projection above middle coxa. First sternite conically produced basomedially. Mesoscutum with two lateral yellow stripes near middle. Propodeum smooth dorsally, with only scattered punctures laterally. (In general thorax sparsely hairy and highly polished). Java (♀ only known).
5. sundaicus, n. sp. (p. 15)
- Metasternal carina not forming conical projections in the middle. Median metasternal groove distinct and widely open behind between hind coxae (metasternal carina curving around hind coxae). Submetapleural carina short, extending only in anterior 0.5 of metapleurum and forming a broadly rounded flange above middle coxa. First sternite not conically produced basomedially, only with a short tubercle. Mesoscutum wholly black. Propodeum more punctate dorsolaterally. (In general thorax hairy and subpolished.) India: Himachal Pradesh. (♂ only known.)
6. kamathi, n. sp. (p. 16)
3. Metasternum shiny and with a finger-like projection between middle and hind coxae (fig. 3). Submetapleural carina broadly reflexed above middle coxa and forming a short triangular projection. Antenna 0.8 as long as the body, slender. Ovipositor 0.8 to 1.0 as long as body, its tip with very closely spaced oblique teeth (fig. 3). Base of first sternite with a forwardly directed projection. (Female only known.) India, Nepal, Taiwan. 4. digitalis, n. sp. (p. 13)
- Metasternum apically rough and hairy, with a posteriorly directed pair of closely set and blunt tubercles between hind coxae (fig. 2). Submetapleural carina narrowly reflexed and broadly triangular above middle coxa. Antenna shorter, about 0.65 to 0.75 the body length and somewhat thickened preapically. Ovipositor about 0.8 as long as the body, its tip with moderately spaced vertical teeth (fig. 2). Base of first sternite without any projection. 3. divinator 4
4. Tegula brown or with a brown spot (in American populations yellow). Side of scutellum and middle coxa reddish-brown. Abdominal yellow bands very narrow, often incomplete or absent on some or most of the tergites. Body slender, 7-9 mm. long. Submetapleural carina complete to hind coxal cavity, straight. Metapleurum not strongly striate near hind coxa.

Male without yellow marks on mesoscutum or mesopleurum. Widely distributed in Holarctic Region. 3a. divinator divinator Rossi (p. 9) Tegula, sides of scutellum, and middle coxa largely yellow. Abdominal yellow bands always prominent. Body stouter, 10-11 mm long. Submetapleural carina a little obliterated posteriorly and bent inwards. Metapleurum obliquely striate near hind coxa (fig. 2). Male with yellow marks in the region of notauli and on mesopleurum. Hind tibia and tarsus tending to be darker. India: Himalaya.

3b. divinator himalayensis, n. subsp. (p. 12)

3b. PERITHOUS DIVINATOR HIMALAYENSIS, n. subsp. (fig. 2)

Female: Antenna a little thickened preapically, about 0.65 to 0.75 as long as the body. Face punctate in the center, smooth along orbital borders, its upper edge a little cleft between antennal sockets. Frons, vertex, temple and occiput smooth and shiny, but hairy, especially the temples. Mesoscutum subpolished, beset with short hairs. Pronotum shallowly wrinkled in the median groove, otherwise subpolished. Mesopleurum polished, sparsely hairy. Metapleurum polished, with minute punctures dorsoapically, area close to hind coxa ruguloso-striate (fig. 2). Submetapleural carina narrow and not widened above middle coxa, a little obliterated apically, where it is bent inward and meets metasternal carina which forms two closely set posteriorly directed teeth-like projections (fig. 2). This area also conspicuously hairy. Median groove on metasternum distinct in apical 0.75. Propodeum finely punctate dorsolaterally, smooth basomedially. Apical transverse carina complete or slightly obliterated in the middle, bounding a smooth and shiny petiolar area. Propodeum with a shallow median groove up to the transverse carina. Abdominal tergites subpolished with scattered punctures, those on first distributed all over except in the apical portion, those on second weaker in apical half, those on third and the following tergites confined to basal 0.25 with tubercles and apical areas mat to subpolished. Sides of tergites densely punctate. Tubercles rather weak and more distinct only on tergites 3-5. Ovipositor about 0.8 the body length, its tip with parallel, slightly arched teeth confined to an area about 2.5 its depth (fig. 2).

Black with mesopleurum, mesosternum, mesoscutum and scutellum reddish-brown. Scape and pedicel yellow ventrally. Flagellum brown. Basal two to three flagellar segments also yellowish ventrally. Face laterally and just below antennal sockets, upper orbital borders, clypeus along basal and lateral margins, mandible in basal half, upper margin of pronotal collar, tegula, subtegular ridge, sides and apex of scutellum, metascutellum, mesepimeron, and a semicircular mark on propodeum along apical transverse carina, yellow. Legs reddish-brown except fore and middle coxae yellow, their femora yellow marked and hind tibia and tarsus blackish-brown. Second to fifth abdominal tergites yellow apically. Margins of sixth and seventh tergites broadly yellow laterally and very narrowly so dorsally.

Male: Similar to female with face and clypeus wholly yellow. Mesoscutum with yellow marks along notaular areas. Scutellum largely yellow. Mesopleurum with indistinct one or two yellow marks. First tergite may be yellow apically in the middle.

This subspecies differs from the typical subspecies in having the submetapleural carina almost obliterated apically and metapleurum more punctate. The tubercles are mat. The male has faint to distinct yellow marks on mesoscutum and mesopleurum. The body coloration is more like that of the

American population of the typical subspecies. The European populations tend to have less yellow on propodeum and abdomen. The abdomen is comparatively strongly punctate. Specimens from Britain examined are rather dark and largely devoid of yellow markings.

Length: 10-11 mm. Fore wing 7.5-8.5 mm. Ovipositor 7.5-8.0 mm. Antenna 7.0-7.5 mm.

Holotype ♀, *India*: Himachal Pradesh: Manali, 1828 m., 19-V-1970, M. K. Kamath (Gupta).

Allotype ♂: Same data as the holotype.

Paratypes: 26♀, 4♂: Same locality as the type, but collected from 2 to 30-V-1970 by various Collectors (Gupta). H. P.: Sangla, 2743 m., Kalpa Valley, 1♀, 16 - VI-1972, Gupta. U.P.: Gangotri, 3000 m., 1♀, 20-VI-1977, G. Singh (Gupta).

4. *PERITHOUS DIGITALIS*, n. sp. (fig. 3)

Readily distinguished by having a finger-like median projection on metasternum between middle and hind coxae, submetapleural carina narrow, but rather broadly reflexed and triangular above middle coxa, this carina a little curved near metasternal carina, first abdominal sternite with a median basal projection, and ovipositor tip compressed and with teeth spaced close together (fig. 3).

Female: Antenna slender, about 0.8 the body length. Face minutely to closely punctate, raised near antennal sockets and with a faint median carina extending in the upper half of face. Clypeus smooth, with setiferous punctures and concave in apical half. Frons and vertex smooth and polished. Vertex posteriorly and temple smooth but hairy. Pronotum polished. Mesoscutum subpolished and hairy. Scutellum a little more convex than in other species and subpolished. Mesopleurum polished, sparsely hairy. Metapleurum polished. Submetapleural carina narrow and forming a short triangular projection anteriorly above middle coxa, just short of reaching posterior metasternal carina. Metasternal carina irregular and forming a characteristic posteriorly directed long finger-like projection (fig. 3) in the middle, with its apex knob-like. Metasternum without a median longitudinal groove. Propodeum shiny, hairy or punctate on sides, with or without a median basal depression; its apical transverse carina complete or incomplete. First tergite smooth or punctate, raised in the middle. First sternite with a strong basomedian forwardly directed projection. Abdomen with protuberances on second and the following tergites, which may be smooth or punctate. Ovipositor rather strongly compressed, about 0.8 to 1.0 the body length, teeth on its lower valve compressed into a small area, occupying about 2.5 its maximum depth, teeth circular and close together, with basal 2-3 teeth divergent (fig. 3).

This species is known only from three females, one each from India, Nepal and Taiwan. They are essentially similar to each other, but exhibit slight differences in punctation and coloration. I prefer to consider them as allopatric subspecies until the extent of variability of each population is known, when they may turn out to be distinct species. Among the three specimens, the specimen from Kashmir has stronger punctation, while the specimens from Nepal and Taiwan are closely related. They can be separated by the following key:

Key to the subspecies of *Perithous digitalis*

1. Inner eye orbits narrowly yellow. Face closely punctate. Propodeum without a white apical semicircular mark. Apical transverse carina distinct and semicircularly arched. Median groove on propodeum extending to its middle. Propodeum punctate laterally. Hind coxa yellowish-brown with a pale yellow dorsal spot. Scape and pedicel black. Bands on abdominal tergites narrow, those on apical tergites rather inconspicuous. India: Kashmir.
- 4a. *digitalis digitalis*, n. subsp. (p. 14)
- Inner orbits broadly yellow—these stripes meeting on face below antennal sockets. Face with minute scattered punctures. Propodeum with a complete semicircular yellow stripe in the region of apical transverse carina, or with two lateral spots, the carina itself indistinct and represented by two lateral tubercles. Median groove of propodeum indistinct to absent. Propodeum smoother. Scape and pedicel white marked. Bands on abdominal tergites wider and conspicuous on second and the following tergites. 2
2. Face with scattered punctures, smooth medially. Propodeum smooth and shiny, with two apicolateral yellow spots. Hind coxa and femur yellow. Hind leg largely yellow with fuscous marks on tibia and tarsus.
- Nepal. 4b. *digitalis nepalensis*, n. subsp. (p. 15)
- Face with minute punctures, without a smooth medial area. Propodeum with a semicircular yellow mark in the region of apical transverse carina, with minute setiferous punctures laterally. Hind coxa and femur yellowish-brown. Hind leg darker yellowish-brown, with tibia extensively black marked. Taiwan.
- 4c. *digitalis taiwanensis*, n. subsp. (p. 15)

4a. PERITHOUS DIGITALIS DIGITALIS, n. subsp.

Female: Face with distinct well separated punctures. Metapleurum wrinkled near hind coxa, otherwise smooth and polished. Propodeum shallowly punctate laterally, with a median groove which extends to its middle; its apical transverse carina distinct and semicircularly arched. Petiolar area mat. First tergite punctate with its apex smoother. Protuberances on second and the following tergites smooth medially, otherwise abdomen sparsely punctate and hairy. Sides of tergites with denser punctures.

Black. Mesoscutum, scutellum (except its apex), and mesopleurum (except narrowly below wings), reddish-brown. Clypeus along epistomal groove, mandible basally, inner orbits narrowly up to the ocellar level, hind corner of pronotum, tegula, subtegular ridge, apex of scutellum, metascutellum wholly, and apices of second to sixth abdominal tergites narrowly, yellow. Mesepimeron brownish-black. First tergite faintly yellow in the middle and seventh tergite yellow laterally. Scape and pedicel without yellow marks, black. Fore and middle legs largely yellowish with yellowish-brown patches on femora. Hind coxa yellowish-brown with a pale yellow dorsal oval spot. Hind femur yellowish-brown with a black subapical ring and its apex yellow. Middle and hind tibiae with black dorsal lines, and their bases and apices also black. Middle and hind tarsal segments yellow with their apices black.

Male: Unknown.

Length: ♀, 8.5 mm. Fore wing 7 mm. Ovipositor 8.5 mm.

Holotype: ♀, *India*: Kashmir, Pahalgam, 7200 ft., 29-VI-1966, M. K. Kamath (Gupta).

4b. *PERITHOUS DIGITALIS NEPALENSIS*, n. subsp.

Female: Face with scattered punctures, smooth medially. Metapleurum smooth and polished. Propodeum smooth and shiny, with a faint indication of a basomedian groove, its apical transverse carina absent, but represented laterally by weak tubercles. Petiolar area smooth and shiny. First tergite largely smooth and shiny. Protuberances on second and the following tergites impunctate and shiny. Second to fourth tergites punctate laterally.

Black. Similar to *digitalis digitalis* but inner eye margins broadly yellow—these marks meeting on face below antennal sockets. Scape and pedicel with ventral whitish-yellow marks. Upper margin of pronotum yellow. Upper margin of mesopleurum broadly black. Mesepimeron yellow. Apex of propodeum with two small lateral yellow marks. Hind leg largely yellow with lateral black marks on femur, tibia and tarsus. Hind coxa faintly marked laterally with yellowish-brown. Bands on second and the following abdominal tergites wider and conspicuous on all tergites.

Male: Unknown.

Length: ♀, 8 mm. Fore wing 7 mm. Ovipositor 6.6 mm.

Holotype ♀, *Nepal*: Kathmandu, Godavari, 1500 m., 29-IX-1970, Gupta (Gupta).

4c. *PERITHOUS DIGITALIS TAIWANENSIS*, n. subsp. (fig. 3)

Female: Face with minute punctures, without a smooth smooth median area. Metapleurum smooth and polished. Propodeum with minute setiferous punctures laterally, with a faint indication of a basomedian groove, without an apical transverse carina, though with lateral weak tubercles. Petiolar area mat. Abdomen smooth as in *nepalensis*, with smooth tubercles and second to fourth tergites punctate laterally.

General coloration similar to that of *digitalis nepalensis*, with scape, pedicel and abdominal tergites broadly yellow. Yellow on face more extensive below antennal sockets. Propodeum with a semicircular yellow mark in the region of apical transverse carina. Hind leg somewhat darker, yellowish-brown, with femur almost wholly yellowish-brown and tibia more extensively black marked.

Male: Unknown.

Length: ♀, 8.5 mm. Fore wing 7.5 mm. Ovipositor 7.5 mm.

Holotype: ♀, *Taiwan*: Taipei, ex Chiu Colln., 1971 (Gupta).

5. *PERITHOUS SUNDAICUS*, n. sp. (fig. 1)

Superficially resembling the Japanese *Perithous mediator japonicus* in coloration, but distinct in having a yellow spot on mesopleurum near upper end of prepectal carina and also by having a very polished metapleurum and metasternum, with the posterior metasternal carina forming distinct conical processes in the middle and the median metasternal groove absent and represented only by a small pit. The submetapleural carina is absent in apical 0.25 and the projection above middle coxa is conical and longer than in *japonicus*. The propodeum is shiny and not punctate as in *japonicus*.

Female: Antenna slender, about 0.8 as long as the body. Face with scattered shallow punctures. Frons, vertex, temple and occiput smooth and shiny. Temple with scattered hairs. Mesoscutum shiny, with minute setiferous punctures. Pronotum, mesopleurum, metapleurum, mesosternum and metasternum shiny and polished. Mesopleurum with scattered minute setiferous punctures. Metasternal carina forming conical projections in the middle between hind coxae. Median metasternal groove indistinct and represented by a pit only. Submetapleural carina distinct in anterior 0.8 of metapleurum, forming a triangular projection above middle coxa, its apical margin reflexed. Propodeum smooth and shiny, with scattered and a little elongate punctures laterally, with a shallow median groove. Apical transverse carina erased medially, although two triangular white marks at this place demarcate a semicircular petiolar area. Tergite shiny, with scattered punctures laterally. First sternite forming a conical projection basomedially. Punctures on second to fourth tergites moderate and well separated. The following tergites smooth with minute setiferous punctures. Teeth on ovipositor tip arched and parallel, extending over to nearly 5.0 the width of ovipositor (fig. 1).

Black. Antenna wholly blackish-brown, without white marks on scape and pedicel. Face except narrowly in the middle, clypeus except in the middle, teeth except apically, upper orbital borders, two linear marks on mesoscutum, upper margin of pronotum, pronotal collar largely, subtegular ridge, an oval spot on mesopleurum at upper end of prepectal carina, mesepimeron, two lateral triangular marks on propodeum in the region of apical transverse carina, scutellum laterally and apically, and metascutellum except basally, yellow. Tegula brown. Fore and middle coxae and fore trochanters yellow. Hind coxa reddish-brown with an oval dorsal yellow spot at base. Legs otherwise brownish-yellow, with fore legs lighter in color and middle tarsus and hind tibia and tarsus brownish-black. Apices of first (narrowly), 2nd and 3rd tergites brownish, those of fourth laterally, fifth completely and sixth and seventh tergites laterally, yellow.

Male: Unknown.

Length: ♀, 12 mm. Fore wing 10 mm. Ovipositor 15 mm.

Holotype ♀, Java: Tjibodas, 1400 m., 27 to 29 - VII - 1930, M. A. Lieftinck (Townes).

Paratype ♀, W. Java: Mt. Gedeh, 28 - XI - 1935, ex Betrem Coll. (Gupta).

6. PERITHOUS KAMATHI, n. sp.

Similar to the Javanese *sundaicus*, n. sp., and mainly distinguished by the absence of conical tubercles on metasternum and first sternite, complete metasternal groove, which is widely open behind between hind coxae, and short submetapleural carina extending in anterior 0.5 to 0.6 only and forming a broadly triangular flange above middle coxa. The propodeum is punctate dorsolaterally and the apical transverse carina is distinct throughout. The mesoscutum does not have yellow stripes.

Male: Antenna long and slender, about 0.8 as long as the body. Face punctate. Frons, vertex, temple and occiput smooth, with temple and vertex posteriorly sparsely hairy. Mesoscutum subpolished, with short hairs. Pronotum, mesopleurum, metapleurum, and metasternum shiny, polished, with mesosternum subpolished and more hairy (as in mesoscutum). Metasternal carina almost absent, faintly represented in the middle, not forming conical projections. Median metasternal groove distinct and widely open behind.

Submetapleural carina extending in anterior 0.5 to 0.6 only and forming a broadly triangular flange above middle coxa. Propodeum with distinct well separated punctures except in the central region, its median groove faint. Apical transverse carina distinct. First tergite with scattered punctures, its sternite with a blunt projection at base. Second to fifth tergites more punctate, punctures well separated. The following tergites progressively minutely punctate.

Black. Scape and pedicel yellow beneath. Flagellum black. Face and clypeus wholly, upper orbital borders, pronotal collar medially, upper margin of pronotum, subtegular ridge, an oval spot on mesopleurum at the end of prepectal carina, mesepimeron, apical half of scutellum, metascutellum, two triangular marks on propodeum near apical transverse carina, and apices of all abdominal tergites, yellow. Tegula yellowish-brown. Fore and middle coxae and trochanters yellow, their femora, tibia and tarsi yellowish-brown. Hind coxa and femur orange brown, coxa yellow basodorsally, tibia and tarsus blackish. Apical tarsal segment of middle tarsus also black.

Female: Unknown.

Length: ♂, 11-14 mm. Fore wing 8-11 mm.

Holotype: ♂, *India*: Manali, Himachal Pradesh, 1828 m., 20-V-1970, M. K. Kamath (Gupta).

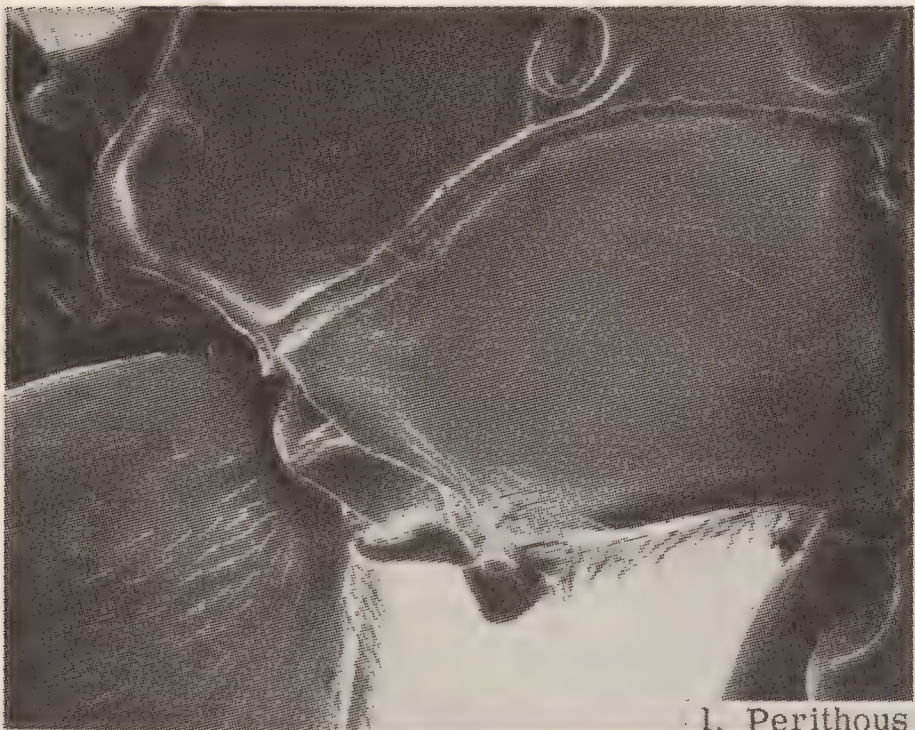
Paratypes: 7♂, same locality, collected during 17 to 23-V-1970 (Gupta).

REFERENCES

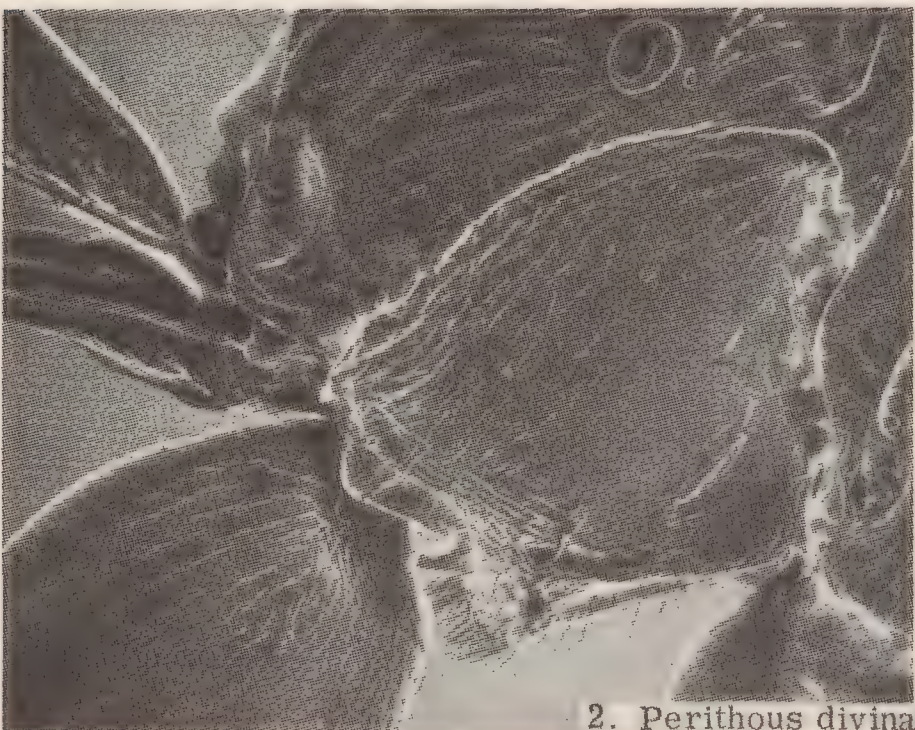
1. Aubert, Jacques -F. 1969. Les Ichneumonides Ouest-Palearctiques et leurs hôtes. 1. Pimplinae, Xoridinae, Acanitinae. Ouvrage Publee avec le Concours du CNRS Pp 1-304.
2. Baltazar, C. R. 1961. The Philippine Pimplini, Poemeniini, Rhyssini, and Xoridini (Hymenoptera: Ichneumonidae, Pimplinae). Monogr. Natl. Inst. Sci. & Technol. Manila 7: 1-130.
3. Borries, H. 1897. Om *Perithous mediator* og *Omalus auratus*. Vidensk. Medde. Dansk. Naturh. Foren. 1897: 153-159.
4. Brocher, Fr., 1926. Observations sur la *Perithous mediator* Gr. Ponte, Oeuf, larve, Nymphe et Imago. Etude anatomique de la tariere, de ses muscles et de son fonctionnement. Ann. Ent. Soc. France 95: 393-410.
5. Carlson, R. W. 1979. Family Ichneumonidae. In Krombein, *et. al.*: Catalog of Hymenoptera in America north of Mexico 1: 315-740.
6. Champlain, A. B. 1922. Records of Hymenopterous Parasites in Pennsylvania. Psyche 29: 95-100.
7. Constantineanu, M. I. & Constantineanu, R. M. 1968. Contributions à l'etude du genre *Perithous* (Hym., Ichneum.) de la R. S. Romania. Zool. Anz. 180(3-4): 228-258.
8. Constantineanu, M. I. & Pisică, Constantin, 1977. Fauna Republicii Socialiste Romania. Insecta, Hymenoptera, Ichneumonidae 9(7): 1-310.

- 18 Contrib. Amer. Ent. Inst., vol. 19, no. 4, 1982
9. Danks, H. V. 1971. Biology of Some Stem-Nesting Aculeate Hymenoptera. Trans. R. Ent. Soc. London 122: 323-399.
10. Haupt, H. 1938. Die Pimplinen der Schlupfwespen-Fauna von Bellinchen (Oder). Märk. Tierwelt 3(3): 181-221.
11. Haupt, H. 1954. Fensterfänge bemerkenswerter Ichneumoniden. Deutsch. Ent. Ztschr (n.f.) 1: 99-116.
12. Horstmann, K. 1964. Zur Biologie der Holzanbohrenden Schlupfwespen, *Perithous divinator* Rossi (Hym., Ichneum.). Fauna Mitt. Norddeuschl. 2: 193-197.
13. Horstmann, K. 1967. Untersuchungen über eine wirtsbedingte Modification bei der Schlupfwespen *Perithous divinator* (Rossi) (Hym., Ichneum.). Zool. Anz. 178: 95-102.
14. Krombein, K. V. 1960. Biological Notes on some Hymenoptera that Nest in Sumach Pith. Ent. News 71(2-3): 29-36; 63-69.
15. Mirek, J. 1963. Zweiter Fund von *Perithous albicinctus* (Gravenhorst) in Polen samt Angaben über andere Arten der Gattung *Perithous* Holmgren (Hymenoptera, Ichneumonidae). Fragm. Faunist. 10: 419-423.
16. Oehlke, J. 1966. Revision der Ephialtinae-Typen von H. Haupt (Hymenoptera, Ichneumonidae). Reichenbachia 6(32): 279-285.
17. Oehlke, J. 1967. Westpaläarktische Ichneumonidae. I. Ephialtinae. In Junk: Hymenopterorum Catalogus (nova editio), part 2: 1-48.
18. Parker, F. D. & Bohart, R. M. 1966. Host-Parasite Associations in some Twig-Nesting Hymenoptera from Western North America. Pan-Pacific Ent. 42: 91-98.
19. Rheinhard, E. G. 1929. *Pemphredon* and her enemies. Nature Mag. 13: 155-157.
20. Short, J. R. T. 1978. The final larval instars of the Ichneumonidae. Mem. Amer. Ent. Inst. 25: 1-508. (*Perithous* on pages 25 and 173).
21. Thomas, S. J. 1964. *Perithous divinator* Rossi and its host, *Pemphredon lethifer* Shuckard. Michigan Acad. Sci., Arts & Letters 49: 199-201.
22. Townes, H. 1944. A Catalog and Reclassification of the Nearctic Ichneumonidae (Hymenoptera), Part I. The subfamilies Ichneumoninae, Tryphoninae, Cryptinae, Phaeogeninae and Lissonotinae. Mem. Amer. Ent. Soc. 11(1): 1-477.
23. Townes, H. & M. 1960. Ichneumon-flies of America North of Mexico: 2: Subfamilies Ephialtinae, Xoridinae, Acaenitinae. U. S. Natl. Mus. Bull. 216(2): 1-676.

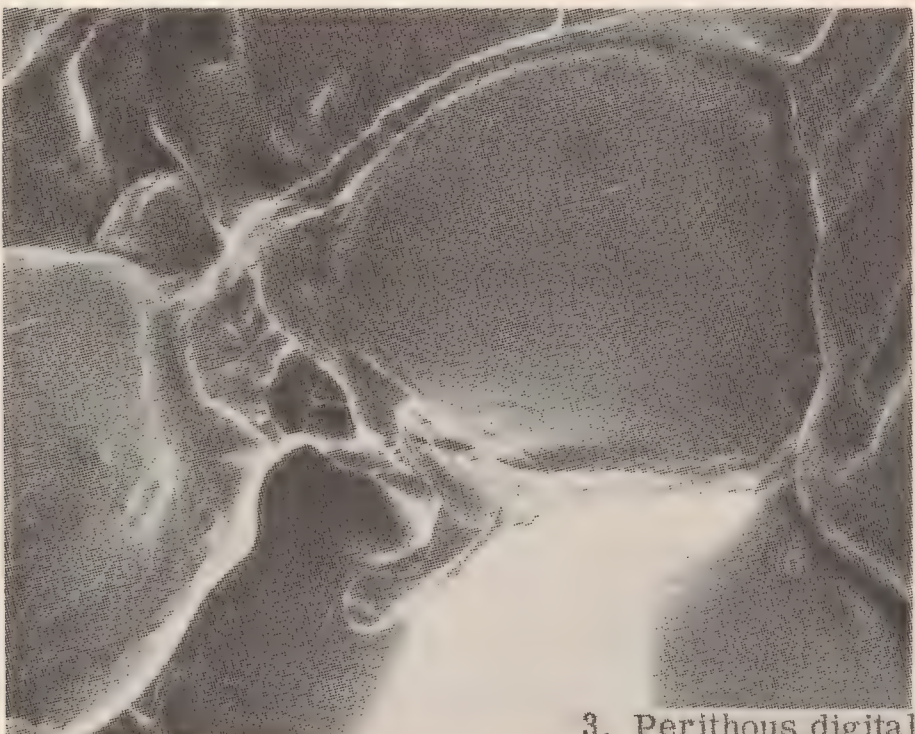
24. Townes, H., Momoi, S. & Townes, M. 1965. A Catalog and Reclassification of Eastern Palearctic Ichneumonidae. Mem. Amer. Ent. Inst. 5: 1-661.
25. Townes, H. 1969. The Genera of Ichneumonidae, Part I. Ephialtinae to Agriotypinae. Mem. Amer. Ent. Inst., 11: 1-300.



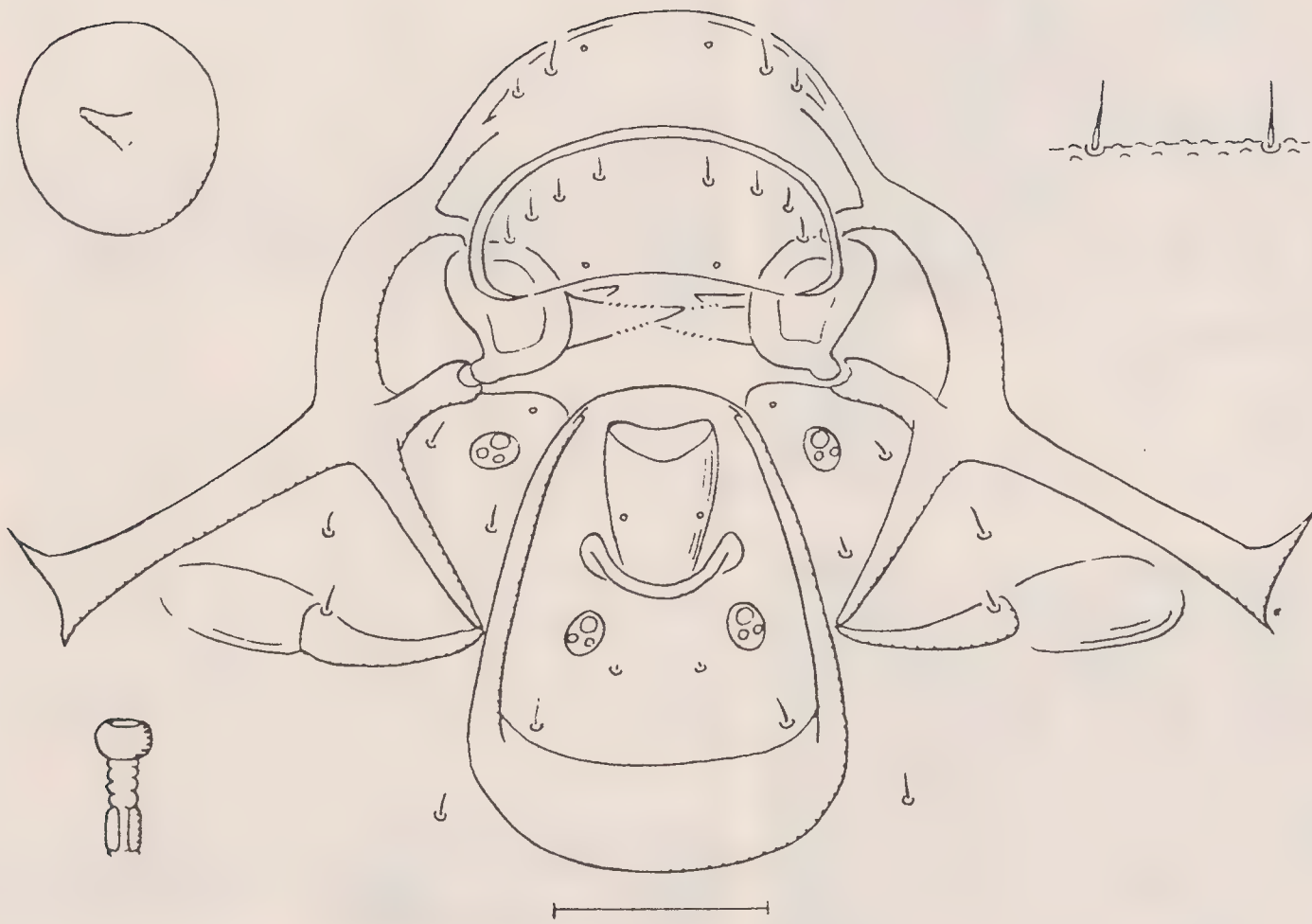
1. *Perithous sondaicus* Gupta



2. *Perithous divinator himalayensis* Gupta



3. *Perithous digitalis taiwanensis* Gupta



4. Larval head of Perithous divinator divinator

(After Short, 1978)